SOCIAL FACILITATION
IN NATIONAL BASKETBALL ASSOCIATION TEAMS

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Abstract

Although social facilitation has been extensively studied over the last 50 years in various domains, it has largely been understudied in the context of team sports. A total of 8950 National Basketball Association (NBA) games were investigated to assess how a team's skill level and experience interact with audience size to predict performance. More specifically, audience size was measured in two ways: as the number of people in attendance at each game and whether the game was locally televised (fewer television viewers) or nationally televised (more television viewers). Contrary to expectations, underdog teams performed significantly better with larger audiences, an effect not found for their favoured counterparts. Also contrary to expectations, teams less experienced than their opponents performed significantly better in nationally televised games than in locally televised games. This effect was not found for more experienced teams. Additionally, no teams experienced a decrease in performance. These results add important findings to the information regarding sports and social facilitation and provide insight into team selection for high stakes games. They also enhance the sporting literature base which is considerably lacking in its assessment of social facilitation effects.

Social Facilitation in National Basketball Association Teams

Since Triplett (1898) first noticed the effect the presence of others impresses on task performance, social facilitation has been a commonly studied phenomenon in social psychology. This research examines the influence of attendance (i.e., the number of spectators who attend a game) and television viewers on the performance of basketball teams. Several basic hypotheses were tested based on Zajonc's (1965) social facilitation hypothesis. Zajonc (1965) suggested that if an audience is present when an individual is performing a task, then the dominant or typical response is facilitated. For example, if a person is performing a task that is familiar and well learned, the dominant response is successful performance. Conversely, when performing a skill that is less familiar to an individual, the dominant response is likely failure and so an audience impairs success. Termed "social facilitation", Zajonc's theory has since been tested vigorously in many areas involving performance in the presence of others. Based on this theory (Zajonc, 1965), the present study hypothesised and tested whether the number of people in an audience and the presence of television viewers would improve the performance of teams who are favoured because performance in the game should be slightly easier for this team than their underdog opponent. According to Zajonc (1965) the audience would induce arousal in the athletes, which would then lead to these athletes performing the dominant response. This work also hypothesised and tested whether larger crowds and more television viewers would improve the performance of teams with players who have more experience than their opponents. This is because more experienced teams will have acquired more hours of game time and so playing basketball will be more familiar to these teams. The following sections will unpack the various elements involved in this work.

A Brief History of Social Facilitation

Triplett (1898) is often cited as being a pioneer of social psychology (Bowman, Weber, Tomborini, & Sherry, 2013; Greer, 1983; Stroebe, 2012; Strube, 2005) and the first to notice the presence of others affecting performance in individuals. Triplett (1898) originally noticed this effect while observing bicycle racers, finding that cyclists who cycled in a pack during a race cycled significantly faster than cyclists who cycled alone. Additionally, Triplett conducted a study with children that required them to reel in a fishing line. He noted that children tended to reel faster in the presence of other children than they did when alone. Triplett concluded that the presence of another contender produced a latent energy that was not usually available to the individual. Interestingly, Strube (2005) applied modern statistical methods to Triplett's (1898) data and found there may not have been such a strong effect as was reported. In fact, many of Triplett's analyses failed to meet statistical significance (although there were trends towards significance). Furthermore, Stroebe (2012) notes that although Triplett (1898) is revered a central forerunner of social psychology, plenty of social research was being undertaken before Triplett's (1898) famous bicycle studies. In fact, Triplett may not have been the first to investigate social facilitation (Stroebe, 2012), and Strube's (2005) findings show how vastly overstated Triplett's (1898) findings have been. Nonetheless, the findings of Triplett (1898) sparked a vast research endeavour to find evidence for the legitimacy of social facilitation.

Many early studies investigated this idea of social facilitation by having participants complete tasks in the presence of others (e.g., Allport, 1924; Bergum & Lehr, 1963; Dashiell, 1930; Travis, 1925). It was another 26 years before the term "social facilitation" was coined by Allport (1924). Allport noted an effect of audience presence on performance, reporting that participants performed better in tasks of word association and multiplication when in a group situation, but that this did not occur during a problem solving task. He concluded that

co-workers facilitate tasks particularly when the tasks are well learned. Dashiell (1930) reported a notable increase in accuracy when participants completed simple word association and multiplication tasks in front of an audience. Similarly, Bergum and Lehr (1963) found that following an intensive training session National Guard trainees showed higher accuracy in indicating failures in sequenced light signals when they thought they were being observed compared to when they were alone.

Conversely, some early studies of social facilitation failed to find performance facilitation under audience conditions, instead finding that audiences had a detrimental effect on performance (e.g., Husband, 1931; Pessin, 1933; Pessin & Husband; 1933). Husband (1931) noted that the presence of others inhibited participants' learning of finger mazes. When learning lists of nonsense syllables, Pessin (1933) found participants needed longer to learn the list in the audience condition compared to when they learned the list alone. Additionally, participants on average made a much larger number of mistakes when being observed than they did in the alone condition.

Zajonc (1965), building on Allport's (1924) early theorising, suggested a way to reconcile these seemingly contradictory findings. The core difference between the studies that found a performance improvement and those that found a performance decline was task difficulty. Thus, Zajonc (1965) proposed that when the task being performed is simple and well learned, then an audience will facilitate the performer and the dominant response (i.e., successful performance of the task) will occur. However, if the task is complex and the performer is still learning how to complete it, then an audience will result in a performance decrease. Therefore, Zajonc suggested that the presence of an audience simply enhances the dominant response of a performer. The rationale behind this is that when a task is being learned the dominant response is failure and one is most likely to make mistakes. Once this

task is familiar and perfected, then the dominant response is accurate or successful task performance.

Zajonc (1965) suggested that the audience need only be an observer of behaviour to affect another's performance. That is, no engagement of behaviour of any kind on behalf of the audience is necessary to produce social facilitation effects; their "mere presence" is enough. Multiple studies have supported Zajonc's mere presence hypothesis (e.g., Hunt & Hillery, 1973; Martens, 1969; Zajonc & Sales, 1966). For instance, Hunt and Hillery (1973) investigated social facilitation by having participants' complete simple and complex mazes. A co-acting audience was found to facilitate participants when the maze was simple. The co-acting group made fewer errors when compared to participants who were completing the mazes alone. However, when participants were completing complex mazes, they made fewer errors when performing alone than during a co-acting situation. Hunt and Hillery's study supports Zajonc's (1965) explanation – the mere presence of an audience was enough for participants to show an improvement in the performance of simple, familiar tasks, and a detrimental effect on performance in complex tasks that were not well learned.

Explanations of Social Facilitation

Arousal Theory. Zajonc (1965) used the drive model for behaviour (Hull, 1943) to explain social facilitation, suggesting that arousal (i.e., the degree of stimulation experienced by a person) and the strength of a habit coincide during a task to produce a response. When the task is well learned or simple to the performer, the dominant response is habitual and is likely to be correct. However, with unfamiliar, difficult tasks the dominant response tends to be an incorrect one. According to Zajonc (1965) the presence of spectators increases the arousal of an individual, and it is this heightened arousal that raises the possibility of dominant response occurrence during task performance. This mere presence of spectators is a

source of non-directive and non-specific arousal that heightens dominant responding in a performer (Markus, 1978).

Research has shown that social facilitation occurs because the presence of spectators intensifies the level of physiological arousal among performers (Fredrikson & Gunnarsson, 1992). It makes sense that heightened arousal may increase cognitive inflexibility, making the individual less able to think adaptably in a situation. In turn, more difficult or newer tasks (i.e., those requiring more cognitive flexibility) are hindered. Conversely, for easier, well-learned, and automatic tasks that do not require as much flexible thinking, arousal improves focus and speed, and hence improves performance.

However, even though past research has reinforced Zajonc's (1965) arousal theory (e.g., Hunt & Hillery, 1973; Martens, 1969; Zajonc & Sales, 1966), his explanation of the processes behind social facilitation has been disputed.

Evaluation Apprehension Theory. An alternative theory to Zajonc's (1965) arousal explanation for social facilitation was proposed by Cottrell, Wack, Sekerak, and Rittle (1968). In concordance with Zajonc (1965), these authors agreed the presence of others is a necessary stimulus for inducing social arousal during task performance. However, they maintained that such arousal could result from apprehension about the potential that their performance could be evaluated by their peers. Cottrell et al. (1968) argued that it is only under anticipation of positive or negative outcomes that the presence of others encourages performance efforts. According to Cottrell and colleagues (1968), the dominant response elicited during task performance can be explained by the performer perceiving the expertise of the audience regarding the performance task (for example, a musical performance in front of an audience of musicians may lead to apprehension in the performer as they believe their audience has expert musical knowledge). Studies investigating evaluation apprehension theory tend to manipulate audiences in this way to test the effect of audience expertise on

performance (e.g., Cottrell et al., 1968; Paulus & Murdock, 1971). Furthermore, Cottrell et al. (1968) found evidence to dispute Zajonc's (1965) mere presence suggestion, as they found that there was no enhancement of any dominant responses in participants' learning of nonsense words in the presence of a blindfolded audience. However, when the audience was interested and observant of the experiment, the authors noted an increase in the responding from these subjects. Furthering Cottrell and colleagues' (1968) findings, Weiss and Miller (1971) suggest that a learned drive has been acquired by the individual to anticipate certain outcomes when performing in the presence of others. Based on these findings, Cottrell (1972) suggested evaluation apprehension as a modification to social facilitation theory. Cottrell argued that we learn from a young age that the social responses we receive from others are based on their evaluations of our behaviour. It is this knowledge that either impairs or enhances responding during observed task performance. However, these responses are only elicited when participants believe the audience is capable of judging their performance. Support for Cottrell (1972) has also been found in multiple studies (e.g., Cohen, 1979; Lombardo & Catalano, 1978; Paulus & Murdock, 1971; Sanna & Shotland, 1990). Sanna and Shotland (1990) noted that participants performed better on a memory task when an audience was present rather than absent, but only when they anticipated that the audience would evaluate them positively. When participants predicted the audience would negatively evaluate their performance, they worked better alone than under audience scrutiny.

It is possible, however, that arousal theory and evaluation apprehension theory are not mutually exclusive; it may be that Zajonc's (1965) more general account of how social facilitation occurs is refined by Cottrell's (1972) explanation (Cohen & Davis, 1973; Markus, 1978). Cohen and Davis (1973) found support for Zajonc's (1965) mere presence effect and also noted that the apprehension of being evaluated exacerbated the effect of mere presence. Using a hidden-word task, Cohen and Davis (1973) discovered that participants with high

evaluation apprehension displayed a greater tendency to produce the dominant response. These authors proposed that evaluation apprehension functions as a mediator between the presence of others and task performance.

Schmitt, Gilovich, Goore, and Joseph (1986) also found results supporting Zajonc's (1965) proposition that mere presence is sufficient to elicit social facilitation effects during a typing task where participants were required to type their name. When an obviously blindfolded confederate with headphones was present in the room while participants were typing, participants typed their name faster than they did when no audience was present. However, evaluation apprehension produced a more dramatic effect for an easy task; participants typed their name the fastest when the researcher peered over their shoulder whilst typing their name. Therefore, evaluation apprehension theory has been supported, but it still requires the "mere presence" of others which is enough to have an attenuated effect on performance.

Distraction-Conflict Theory. In addition to arousal theory (Zajonc, 1965) and the evaluation apprehension hypothesis (Cottrell et al., 1968), it has been proposed that distraction may explain social facilitation (Sanders, Baron, & Moore, 1978). Sanders and Baron (1975) suggested that it may be distraction that increases arousal as the performer experiences conflict when trying to concurrently attend to both the task and the distracting stimulus. Following this line of thinking, the audience is a stimulus that can be distracting and detrimental to performance or conversely can facilitate performance when undertaking simple tasks.

Sanders et al. (1978) developed this idea into distraction-conflict theory. This theory assumes that an audience leads to an increase in activation of attention deriving from the participant wanting to concentrate both on the audience and the task simultaneously. This is called attentional conflict, and is based on the concept that distraction during task

performance absorbs attentional capacity leading to an overload of resources (Parks & Sanna, 1999). That is, focusing on an audience leaves less attentional resources available for successful task performance. If a task is well learned, the task does not require a large amount of attentional capacity to be successfully performed. In these situations, the presence of an audience leads to performance facilitation. This is because although the participant is distracted by the audience (that is taking up valuable attentional resources) the task at hand requires only a small amount of attentional capacity to be performed effectively. Sanders et al. (1978) note that distraction is a form of drive or arousal, which leads to the facilitation of performance. Therefore, even if the performer is distracted by an audience, these well learned tasks are performed with relative ease as they do not require much thought from the actor, leading to task facilitation. However, this is not the case for newly learned skills. With a task that is not well learned and requires a larger amount of attention, if an audience is present the performer's attention is split. Consequently, there is less attentional capacity free to focus on the task at hand. In turn, these performers are therefore likely to experience a performance decline.

Support for distraction-conflict theory has been found by researchers examining people performing tasks alongside others. For example, Huguet, Galvaing, Monteil, & Dumas (1999) used the Stroop test to investigate social presence. Huguet et al. (1999) found that interference during a Stroop task decreased when participants worked with fast or similar paced co-actors when compared to slower co-actors. The results indicated that participants compared their performance to that of their co-actors, which created distraction. Similar results have been found using a vigilance task where they were required to indicate the presence of a symbol after the display of a fixation point. Muller, Atenzi, & Butera (2004) noticed that participants who performed this task in a co-acting setting resulted in fewer errors than when they were performing the task alone. Muller et al. (2004) found that co-

acting others who were told they were inferior relative to their opponent at completing the task at hand led to decreased errors in participants when compared to participants who were acting alone or who had a co-actor who performed badly. This suggests that participants who were told that they were performing poorly strive to better their performance. However, when participants were advised that they were superior to their opponents, they performed no better than participants in the alone condition. That is, the participants in this group made more errors. Muller et al. (2004) suggest that these results can be explained by a downward social comparison in participants resulting from a decrease in focus toward the task at hand as they are distracted by their opponent, providing support for distraction-conflict theory.

Unsurprisingly, not all research has supported distraction-conflict theory. Feinberg and Aillo (2006) compared distraction-conflict and evaluation apprehension theories in an attempt to come to a conclusion regarding the source of social facilitation. The results of their word association tasks suggested that evaluation apprehension may be the superior theory. Participants in the evaluation-apprehension manipulation made significantly more errors than the control group. Similar results were not found for participants in the distraction-conflict condition. However, the results also supported distraction-conflict in terms of deterioration in performance in complex tasks, but not in facilitation of performance for complex tasks (although there was a non-significant trend in that direction).

Modern Views. As previously noted, it is now generally accepted that arousal theory (Zajonc, 1965) and evaluation apprehension theory (Cottrell, 1972) are complementary rather than conflicting (Markus, 1978; Schmitt et al., 1986). Similarly, Feinberg and Aiello (2006) found results suggesting both distraction-conflict theory and evaluation apprehension theory could explain social facilitation effects. Generally, it seems that Zajonc (1965), Cottrell (1972), and Sanders et al. (1968) may all add value to the explanation of social facilitation, with the latter theories being developed from Zajonc's (1965) original explanation. Indeed,

Guerin (1993) mentions that all theories of social facilitation (including distraction theory and evaluation apprehension theory) contain mere presence in their explanations. Hall and Henningsen (2008) note that mere presence continues to be used as a main structure for understanding social facilitation, even in recent years (e.g., Platania & Moran, 2001). Although it is generally accepted that a multitude of factors explain social facilitation (Markus, 1978; Schmitt et al., 1986), it is suggested that social facilitation occurs because the presence of spectators intensifies the level of physiological arousal among performers (Fredrikson & Gunnarsson, 1992), and this occurs even more intensely when spectators arouse apprehension about being evaluated. It conceptually follows that heightened arousal may decrease cognitive flexibility. As a result, difficult tasks which require more cognitive flexibility are impeded, but for well learned, automatic tasks that do not such flexibility, arousal improves focus and speed, and performance improves.

Current Hypotheses

Based on the theorising above, it was thought that the size of an audience in professional basketball games (both in-person attendance and television viewers) might predict performance of teams. There are differences between the kinds of audiences present at sporting events and the audiences typically studied in the social facilitation literature above. In the typical social facilitation research, the audience size ranges from one to six observers. On the other hand, audiences in professional basketball games range from roughly 8,000 to 23,000 people physically present for games. Television viewers are in the millions. Regardless of the differences between general social facilitation audiences and sporting audiences, the above research suggests that among teams with more experience, and among teams that are simply better and more skilled than their opponent, a positive relationship between audience size and performance may be observed. In other words, among these teams, as the audience size increases, better performance would be expected, such as an

increased tendency to win and a larger margin of victory. Conversely, among teams that are less experienced and skilled, it would be expected that as the size of an audience increases performance would decline. This could be seen by an increased tendency to lose and the loss to be by a larger margin. The following section explains past research relevant to these hypotheses.

Social Facilitation in Sport

There has been some research in sports relevant to the key hypotheses just described. Most directly relevant, Forgas, Brennan, Howe, Kane, & Sweet (1980) attempted to find social facilitation effects in squash. These researchers assessed skilled and unskilled squash players, expecting the performance of better players to improve when an audience was present. The squash players were unaware of the experiment so as to gain observation of a "real-world" situation. Additionally, within each pair of players it was ascertained which player had superior skills relative to the other. Forgas et al. (1980) found that weaker players' performance improved with an audience, but performance decreased in superior players when observed. These results are the opposite of what would be expected to occur according to Zajonc's (1965) social facilitation theory. According to the authors, it is possible that players undertake an "automatic matching" of their performances under audience conditions. Furthermore, Forgas and colleagues (1980) suggest that when an audience is present, the situation changes from being one of competition to one where the pair of players attempts to provide the audience with their best performance together, so that their skills seem to converge to the point where they seem very similarly matched. In a sense, these players are unconsciously putting on a "good show" for the benefit of the audience. This concept of automatic matching does not fit with Zajonc (1965) and his social facilitation hypothesis.

In other research, Snyder, Anderson-Hanley, and Arciero (2012) found that the "other" does not need to be physically present to activate dominant responses in athletes.

Snyder et al. compared the exercise intensity of participants when a virtual avatar was competing alongside the performer on a computer screen. Participants also competed against a live competitor seated next to them on a virtual reality enhanced bike. The researchers controlled for participant competitiveness. Results showed that competitive riders cycled more intensely when there was a live competitor than when there was a virtual competitor. These participants also cycled more intensely when there was a virtual competitor than when they were cycling alone. The less competitive group did not increase the intensity of their exercise across conditions. That is, for competitive participants, a virtual competitor was enough to facilitate a performance response that led to an increase in cycling output. These are, however, co-action effects, which can be considered a special type of audience. Nonetheless, as previously mentioned, co-acting others have been shown to trigger social facilitation in performers (Allport, 1924; Huguet et al., 1999; Muller et al., 2004; Sanders et al., 1978; Snyder et al., 2012; Triplett, 1898), so are not distinct from audience effects.

In another investigation, Moore and Brylinsky (1993) took advantage of a measles outbreak that induced a quarantine to assess the effects of an audience's presence or absence on college basketball performance. The games of two teams who played more than one game with no audience present were analysed. Results showed that the two teams investigated both performed better (by scoring more points overall, and making more field goals and free throws) when there was no audience present than when there was an audience watching the game. Only a small number of games (20 in total) were analysed and the authors failed to assess each team's dominant response. If the dominant response was success, then these results appear to challenge social facilitation theory. However, if these were unskilled players then the results would support Zajonc's (1965) assertions. It could be assumed that these players were in fact relatively young and inexperienced as the teams assessed by Moore and Brylinsky (1993) were college teams. Therefore, it is likely that these players were between

18 and 21 years of age, and comparatively less experienced than professional basketball teams. It is therefore likely that the results of Moore and Brylinsky actually support Zajonc's (1965) social facilitation theory.

Audience Related Factors in the Explanation of Performance. With regards to team sports, it has long been suggested that crowd factors may have an effect on the outcome of a game (e.g., Schwartz & Barsky, 1977). Schwartz and Barsky (1977) mentioned that basketball and hockey are the two sports with closest proximity to the audience. Baseball and football (in comparison) are somewhat removed from their crowds in that the audience is further away. Additionally, these sports are performed outside, whereas with a sport that has an indoor arena such as basketball, the closeness of the crowd to the athletes is palpable. It has therefore been suggested that increasing the size of an audience or crowd may increase the drive needed to activate social facilitation (McCullagh and Landers, 1976).

Epting, Riggs, Knowles, and Hanky (2011) note that athletes must perform in front of audiences in every game and audiences will articulate support or dissatisfaction regarding the performance they witness. Thus, the audience may affect both individual and team performance in athletics. Audiences in sports are quite different from being simple observers like in many of the early social facilitation studies (e.g., Allport, 1924). Rather than just being objective observers, audiences engage in behaviours which interact with the teams playing a game (Cox, 1994). Cox (1994) mentions the difficulty of studying the "mere presence" of the audience in sport, because there is practically never a circumstance where an audience is "merely present"; a sports crowd has their own set of behavioural norms. For example, these behaviours include applauding a goal for the team they are supporting, heckling or booing when an opposing team member is stepping up for a free throw, or even silence for their supported team member in this situation. Importantly, Underwood (1976) notes that athletes

are highly trained and may be able to disregard an audience, allowing them to focus on task performance.

However, one idea that is not clear is whether differences in crowd size in hundreds or thousands of people matters for enhancing the dominant response. Past research such as McCullagh and Landers (1976) found that arousal activation increased in participants completing a ball-rolling task when the audience size observing the participants increased from one to six. While this research is pertinent for understanding social facilitation within small groups, there are no studies currently that have assessed this concept using large scale audience sizes (e.g., 15,000 attendees versus 20,000 attendees versus 30,000 attendees).

In sum, there are a number of differences between audience and subject characteristics in the typical social facilitation research versus real-world professional basketball players and their audiences. The research on sports and social facilitation is also not completely consistent with the dominant hypothesising on social facilitation. Given these differences and issues, it was not clear whether to expect typical social facilitation effects to be present in professional basketball games. The present study attempted to help address this question and so help fill the gap in this literature.

The Current Study

There is currently little research that has directly assessed social facilitation effects in team sports (e.g., Moore & Brylinsky, 1993) by examining whether the size of the audience interacts with how practiced a team is or what their dominant response is. Furthermore, no research has examined the relationship between the presence of audiences that number in the thousands or millions and performance. The current study aimed to assess this, and also examined the concept of a large imagined audience. Social facilitation theory would predict that among teams that are more skilled and/or more experienced, increasing audience size

should relate to better performance, whereas among less skilled and/or experienced teams, decreasing audience size should relate to worse performance.

To test these ideas, six years of data from the National Basketball Association (NBA) was utilised following the formulation of four specific hypotheses. NBA data is particularly useful for the assessment of these hypotheses given that extensive records containing statistics for each game are available. Specifically, for each game measures of the skill and experience of each team at the point of time of the game were collected or derived. To determine a team's skill level the current study used predictions made prior to each game by sports books or casinos for gambling purposes (i.e., whether each team was favoured or an underdog, and the number of points they were expected to win or lose by). To assess experience, the present study calculated the number of minutes of NBA experience for each player in the starting line-up.

The study assessed audience size in two ways. The attendance record for each game (i.e., how many people were in attendance at the arena) was collected. Prior studies have suggested crowd density may be more important for performance than the raw number of people in attendance (e.g., Agnew & Carron, 1994) but the literature is inconsistent as other studies have shown raw attendance to be the superior measure (e.g., Nevill, Newell, and Gale, 1996).

In addition to this measure of audience size, the idea of audience size was quantified in an alternative and very distinct manner. It was determined whether each game was only broadcast locally or was broadcast nationally (i.e., to far more television viewers). With these measures it was then possible to assess whether the size of the audience related to performance of the team in that game (by looking at the number of points the team won and lost by) and whether this relationship was moderated by either skill level or experience. Specifically, four hypotheses were derived.

Hypothesis 1. The degree to which a team is favoured (or the underdog) in a game should moderate the relationship between attendance at that game and performance in that game. In other words, among superior/favoured teams, attendance should relate positively to performance whereas among inferior/underdog teams, attendance should relate negatively to performance.

Hypothesis 2. The degree to which a team is favoured (or the underdog) in a game should moderate the relationship between the type of screening (either national or local) of that game and performance in that game. Favoured teams should perform better in nationally screened games than locally screened games. Conversely, underdog teams' performance should decrease in nationally screen games compared to locally screened games.

Hypothesis 3. The degree to which a team is more experienced than their opponent in a game should moderate the relationship between attendance at that game and performance in that game. Teams whose average professional experience level was higher than that of their opponents should perform better as attendance at a game increases, while the opposite should occur for less experienced teams.

Hypothesis 4. The degree to which a team more experienced than their opponent in a game should moderate the relationship between the type of screening (either national or local) of that game and performance in that game. Teams whose average experience was greater than that of their opponent's should show an increase in performance as television viewership increases. Conversely, teams whose average experience was less than that of their opponent's should show a performance decline as television viewership increases.

Method

Data Collection

NBA seasons tend to begin at the end of October each year, and run through into mid-June when the playoffs conclude. Therefore, seasons cross over two years (e.g., start in 2013 and end in 2014) and are often referred by both of years that they span. For example, the season that ended in June 2014 is referred to the 2013 – 2014 season. For the sake of consistency, seasons will be referred to in this way from this point.

To test the hypotheses of the current study, data needed to be gathered. Much of the data needed for this research was bought as a data package from an online website (Sports Gambling Databases, n.d.). This data was provided in an excel spreadsheet and consisted of a variety of statistics from every game played in the NBA from the start of the 2006 - 2007 season until the end of the 2012- 2013 season. Both the regular season and playoff games were included. Each game was represented by a row in the spreadsheet, and contained basic information such as the date the game was played, the two teams playing, and the final score. This spreadsheet was called the game log.

Each game was represented twice in the game log to allow for analysis of specific teams individually. Therefore only the home games for each team was analysed so that each game was only assessed once. A total of 8,951 games were included for analysis.

Attendance Data

As mentioned, a key measure was the number of attendees present at each game. Attendance for each game was not included in the purchased data set so this information needed to be collected.

Attendance data was gathered with permission from an internet webpage detailing sporting box scores (www.basketball-reference.com). Each basketball game has a box score

on Basketball-Reference (n.d.) summarising the statistics of the game and of the players involved. These box scores also report the number of attendees present at the game. The box score for each game from the beginning of the 2006 – 2007 NBA season until the end of the 2012 – 2013 season were accessed, and the attendance number was integrated into the game log. Attendance was not available for one game during this time period; therefore this game was omitted from analysis. These scores represent the "absolute attendance" at a game, that is, the actual number of people present during any given game.

Two different concepts can be used to explain crowd size; absolute attendance and attendance (or crowd) density. Absolute attendance refers to the number of people present in a crowd. This is distinct from crowd density, which refers to the percentage to which an arena is full. Both of these concepts have been investigated in multiple studies (e.g., Agnew & Carron, 1994; Nevill et al., 1996; Russell, 1983), showing conflicting findings regarding the importance of these concepts in predicting performance. Thus although absolute attendance is examined in the primary analyses, results using attendance density are footnoted[1].

[1] To calculate attendance density from the absolute attendance information, the maximum capacity of each of the 30 NBA teams' home arenas was collected using a Google search. The absolute attendance at each game was then divided by the capacity of the arena where the game was played, and multiplied by 100 to gain the percentage that the arena was full for that game. This variable was called attendance density and is difference from the "absolute attendance" variable mentioned above due to the difference in seating capacities between different team's home arenas. For example, two teams may have 15,000 spectators present at a game. If the first team's arena has a seating capacity of 15,000, then that game has an attendance density of 100 percent. However, the second team's arena may have a seating capacity of 25,000, which would convert to an attendance density of 60 percent. Similarly, if team two had 20,000 spectators present at their game they would

TV Scheduling Data

For the second key measure of audience size, the number of television viewers was estimated by dividing games up into those that were locally televised and those that were nationally televised. An internet search was run to ascertain what games in the seven seasons being considered were nationally screened. These schedules were released before the beginning of each season. National television screening data was found for the 2007 – 2008 season until the 2012 – 2013 season (inclusive). Despite a thorough search, information was not found for the 2006 – 2007 season. Information for the seasons available was integrated into the database. Nationally televised games were coded as "1" and locally televised games were coded as "0".

The numbers of television viewers will change from team to team and season to season, but it is estimated that a locally screened game will be watched by around 80,000 to 170,000 home viewers (Sports Business Daily, 2014). This number rises dramatically in terms of nationally televised games; regular season games can be watched from anywhere between 800,000 to 7.83 million home viewers (Sports Media Watch, 2014), and during the playoffs can increase to be around 18 million at home game watchers (ESPN, 2014).

Experience Data

For the measure of experience level, for each game the average experience of the away team's starting line-up was subtracted from the average experience of the home team's starting line-up. The starting line-up consists of the five players that begin the game for each team and that generally play the most minutes in a game. Thus positive scores on the experience measure calculated represented a home team that was more experienced than their

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still have less density (80 percent) than team one, even though there were more spectators in attendance at the game.

away team competitor. Negative numbers represented a home team that was less experienced than their competitor.

In order to derive this measure of experience, information regarding the past experience of the players in the starting line-up for each game was obtained. It was decided that years of experience was too inexact to encompass the full extent of a player's experience. This was because of the potential for discrepancy with regards to the number of minutes spent on court actually playing basketball. For example, two players could have debuted in the same year but the first player could have had 350 minutes of game time while the second player only experienced 120 minutes of game time. Therefore, a player's experience for each game was determined by verifying how many minutes he had spent playing basketball in the NBA up until the beginning of that game. This process was undertaken for every starting player in every game played from the start of the 2006 – 2007 season until the end of the 2012 – 2013 season.

Data regarding player experience was again gathered with permission from Basketball-Reference (n.d.). For players who had been active in the years before the seasons being investigated, their player information was accessed to ascertain how many minutes they had played over the course of these seasons. The box score of each game during the seasons in question was used to identify the number of minutes each player spent on court during each game, which was then added to the previous seasons' minutes played in a cumulative manner, if applicable. For instance, if a player was a rookie in the 2006 – 2007 season and he played three minutes during the first game of the season, his experience for the first game would be zero. For the second game, his experience would be three as he then had three minutes of experience.

The experience of each player in the starting line-ups for each game was summed and an average was computed to gain the average team experience. The average experience of the away team was then subtracted from the average experience of the home team.

Spread

To assess how skilled each team was compared to their opponent, the "spread" was used. The spread is the degree to which each team playing was favoured or the underdog in each game. The spread is set just before each game by bookmakers (such as the TAB) and provides a prediction of how many points each team will win or lose by in each game. It is essentially a prediction of the final score and takes into account a number of factors, the most important of which is each team's performance up to that season and including the prior game. The spread was one of the variables in the game log. Counter-intuitively, a negative spread predicts that a team will win, while a positive spread predicts a loss. For example, a spread of -2 means that a team is predicted to win by two points, and a spread of -5 indicates that a team is predicted to win by five points. Conversely, a spread of 2 indicates that a team is predicted to lose by two points.

Margin of Victory

The key dependent variable in all of the analyses was performance. Margin of victory (how many points a team wins or loses by) was used as the measure of performance in each game. This was found by subtracting the points scored by the away team from the points of the home team being analysed.

Results

Descriptive Statistics

The main variables of the study are displayed in Table 1. Of note, the margin of victory shows that teams playing at home were more likely, on average, to win than their opponents (*M* = 3.21, *SD* = 13.13). This is reflected further by the spread (*M* = -3.42, *SD* = 5.95).

Table 1. *Means and Standard Deviations of Main Variables*

	M	***SD***
MoV	3.21	13.13
Attendance	17525.84	2759.74
Spread	-3.42	5.95
Team Age	27.40	2.33
Team Experience	447.60	187.36
Age Difference	0.01	3.33
Experience Difference	2.32	263.75

*N=8950

Correlations for the main variables of the study are displayed in Table Two. Margin of Victory was significantly related to Absolute Attendance (r = .10), Spread (r = -.45), and Average Experience Difference (r = .25)[2].

Table 2. *Correlations between Main Variables*

		1	2	3	4
1	Absolute Attendance[a]				
2	National/Local[b]	.139*			
3	Margin of Victory[a]	.097*	.018		
4	Spread[a]	-.183*	-.007	-.451*	
5	Average Experience Difference[a]	.134*	-.004	.246*	-.555*

[a]N = 8950. [b] N = 7642. * p = <.001

[2] Attendance Density was found to be significantly correlated with Margin of Victory (r = .11, p = <.001).

Hypothesis 1

It was predicted that favoured teams' performance would improve as attendance increased, whereas underdog teams' performance would decline as attendance increased. This would result from the audience facilitating the dominant response in teams. That is, favoured teams are more skilled, which could elicit a positive response, while underdog teams would know they are not favoured, which would elicit a negative response.

To analyse this hypothesis, Spread, Absolute Attendance and the interaction between these two variables were entered into a regression, using Margin of Victory as the dependent variable. The results showed a main effect of Spread (B = -5.89, t(8949) = -46.59, p = <.001), indicating that the more points a team was predicted to win by the greater Margin of Victory was. The main effect for Absolute Attendance was non-significant (B = 0.18, t(8949) = 1.38, p = .17). The results show that Spread and Absolute Attendance did not interact to predict Margin of Victory in NBA games (B = 0.10, t(8949) = 0.79, p = .43)[3].

Though the interaction was not significant, the data is plotted in Figure 1 to fully show the data. The figure clearly shows the main effect of Spread on Margin of Victory; home teams who were favoured performed better than their underdog opponents. Underdog teams benefited from larger audiences, performing significantly better with more attendees present than when there were fewer audience members (b = 0.28, t = 2.21, p = .03). Favoured teams, however, did not experience an increase in performance in games with larger audiences (b = 0.07, t = 0.47, p = .64).

[3] A regression run with Attendance Density substituted for Absolute Attendance showed a main effect of Spread (B = -5.87, t(8949) = -46.15, p = <.001. Although there was not a main effect of Attendance Density, the results trended towards significance (B = 0.24, t(8949) = 1.82, p = .07). Spread and Attendance Density did not interact to predict Margin of Victory (B = 0.06, t(8949) = 0.44, p = .66).

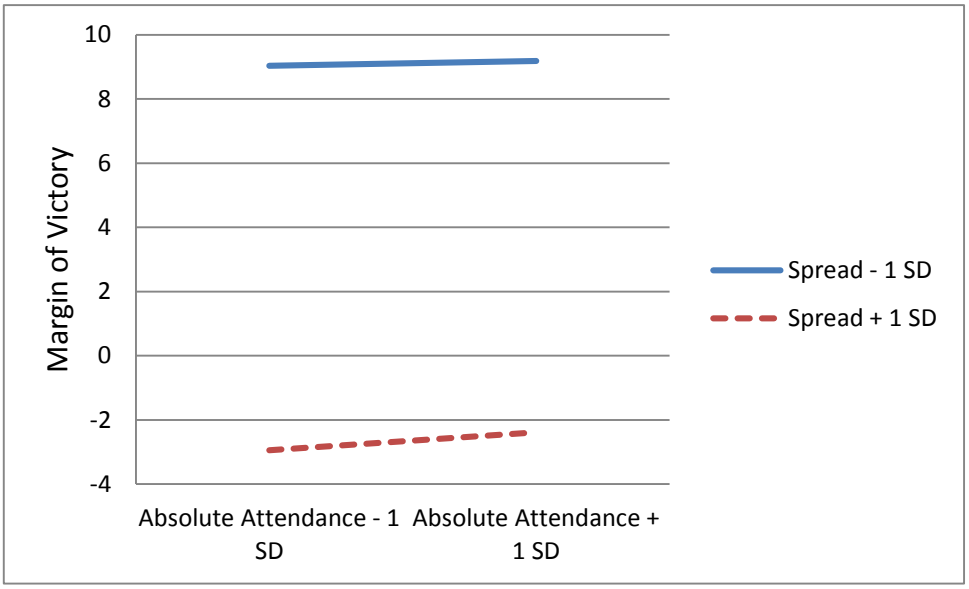

Figure 1. Interaction between Spread and Absolute Attendance Predicting Margin of Victory

Hypothesis 2

It was predicted that favoured teams' performance would improve as the imagined audience increased, whereas underdog team's performance would decline as this imagined audience increased. This would result from the national screening of the game facilitating the dominant response in teams as they may be aware that they are performing in front of increasing numbers of live home viewers. That is, favoured teams are more skilled than their opponent, which could elicit a positive response when a team is playing a nationally screened compared to locally screened game, while underdog teams would know they are not favoured, which would elicit a negative response in this situation.

This hypothesis was analysed by entering Spread, National/Local and the interaction between these two variables into a regression, using Margin of Victory as the dependent variable. The results showed a main effect of Spread (B = -0.46, t(7648) = -44.94, p = <.001), again indicating that the more points a team was predicted to win by was positively related to an increased Margin of Victory. The main effect for National/Local was non-significant (B = 0.02, t(7648) = 1.43, p = .15). The interaction between Spread and National/Local was also

non-significant (B = 0.04, t(7648) = 0.31, p = .76). These results show that Spread and National/Local did not interact to predict Margin of Victory in NBA games.

Figure 2 shows the main effect of Spread in both nationally and locally screened games. Regardless of the kind of television screening, teams who were predicted to win (i.e., were favoured) scored more points than their underdog counterparts. National versus local screening was not found to be significantly related to performance in favoured teams (b = 0.15, t = 0.77, p =. 44) or underdog teams (b = 0.23, t = 0.19, p =. 22).

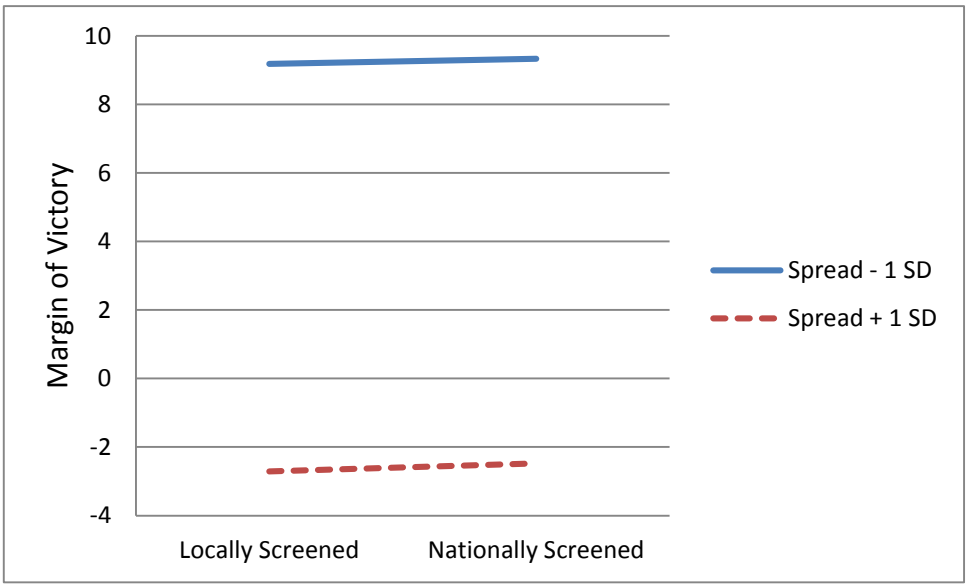

Figure 2. Interaction between Spread and National/Local Screening Predicting Margin of Victory

Hypothesis 3

It was expected that teams whose average basketball experience was greater than that of their opponents would perform increasingly better as game attendance increased, while teams whose average basketball experience was less than that of their opponents would perform increasingly worse as game attendance increased.

To analyse this hypothesis, Average Experience Difference, Absolute Attendance and the interaction between these two variables were entered into a regression, using Margin of Victory as the dependent variable. The results showed a main effect of Average Experience Difference (B = 3.17, t(8949) = 23.00, p = <.001), showing that the more experienced a team

is in comparison to their opponent, the more that team is likely to win by. Similarly, a main effect of Absolute Attendance was found (B = 0.80, t(8949) = 5.89, p = <.001), showing that as the size of the audience present at a game increased, the Margin of Victory of the home team also increased. The interaction effect of Average Experience Difference and Absolute Attendance on Margin of Victory was also significant (B = -0.41, t(8949) = -2.69, p = .01)[4]. Figure 3 shows the main effects of Average Experience Difference and Absolute Attendance on Margin of Victory. This indicated that teams who were more experienced than their opponents scored more points than their less experienced counterparts and as the number attendees present in an arena increased, the better the home team performed relative to the away team.

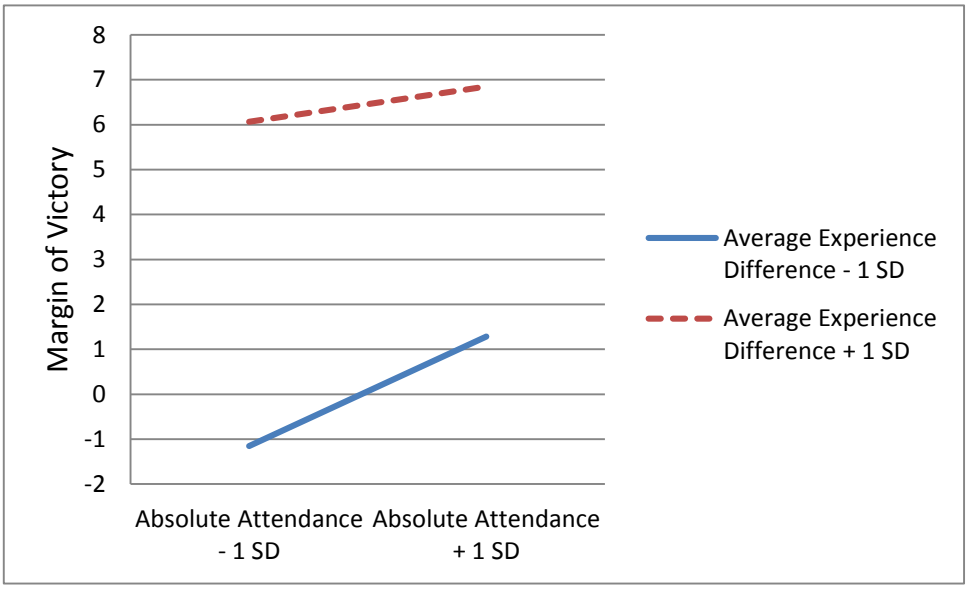

Figure 3. Interaction between Average Experience Difference and Absolute Attendance Predicting Margin of Victory

More experienced teams showed a significant increase in performance in games with more attendees (b = 0.39, t = 2.37, p = .02). Less experienced teams showed a more dramatic

[4] A regression run with Attendance Density substituted for Absolute Attendance a main effect of Average Experience Difference (B = 3.15, t(8949) = 22.60, p = <.001). Similarly, a main effect of Attendance Density was found (B = 1.04, t(8949) = 7.62, p = <.001). The interaction effect of Average Experience Difference and Attendance Density on Margin of Victory was marginally significant (B = -0.26, t(8949) = -1.70, p = .09).

increase in performance in games that were attended by more people (b = 1.22, t = 9.95, p = <.001). These results show that regardless of experience level, teams perform better with more attendees present, although less experienced teams experience more of a performance increase than more experienced teams do.

Hypothesis 4

It was additionally expected that teams whose average basketball experience was greater than that of their opponents would perform increasingly better in nationally screened games compared with locally screened games as there would be a larger audience watching the game from home. Conversely, it was expected that teams whose average basketball experience was less than that of their opponents would perform increasingly worse in nationally compared to locally screened games.

This hypothesis was analysed by entering Average Experience Difference, National/Local screening and the interaction between these two variables into a regression, using Margin of Victory as the dependent variable. The results showed a main effect of Average Experience Difference (B = 0.25, t(7648) = 22.38, p = <.001), showing that as the difference in experience between teams increased so did the Margin of Victory. The main effect for National/Local screening was marginally significant (B = 1.04, t(7648) = 1.67, p = .09). The interaction effect of Average Experience Difference and National/Local Screening on Margin of Victory was statistically significant (B = -0.04, t(7648) = -3.30, p = <.001).

Figure 4 shows the main effect of Average Experience Difference. The figure indicates that more experienced teams win by more points than less experienced teams. Interestingly, teams who were on average less experienced than their opponents performed significantly better in nationally screened games than they did in locally screened games (b = 0.71, t = 3.52, p < .001), while their more experienced counterparts did not experience this effect (b = -0.22, t = -1.11, p =.27).

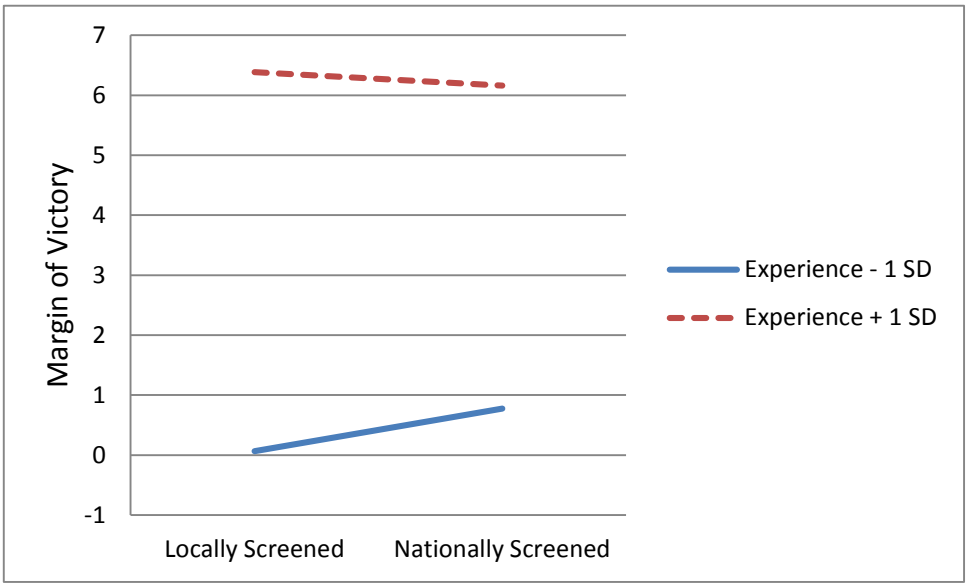

Figure 4. Interaction between Average Experience Difference and National/Local Screening Predicting Margin of Victory

Discussion

Currently, there are few studies that have focused exclusively on social facilitation in sports (e.g., Moore & Brylinsky, 1993). Within this limited literature, previous work has tended to use small samples for their analyses. The present study aimed to investigate social facilitation in a large number of NBA basketball home games, taking into account the number of attendees present at the game, the television screening of the game, the favoured or unfavoured status of the team, and the experience of the players involved. Currently, no research has investigated social facilitation involving audiences of thousands of people, or explored the concept of an imagined audience of millions of television viewers. The current study endeavoured to assess social facilitation in audiences of this size.

Favourability, Audience Size and Performance

Following social facilitation theory (Zajonc, 1965), the current study explored whether the spread of a game (the number of points that a team was predicted to win or lose by) would moderate the relationship between attendance at that game and successive performance. It was expected that the team that was favoured in the game would experience a boost in performance as the audience increased because the audience would amplify the dominant response. Conversely, it was predicted that underdog teams would suffer a performance decline in these conditions. As the underdog teams were playing a superior opponent, these teams could be said to be less skilled than their opponent, which could have a detrimental effect on their performance. Using the National/Local screening of the game as a proxy for attendance, the same effect was expected with regards to performance. It was hypothesised that favoured teams would perform better in nationally screened rather than locally screened games as the imagined audience would be much larger for nationally screened games. Similarly, the opposite was expected for underdog teams. The results of the current study were contrary to the hypothesis. Spread was found to be positively related to

margin of victory. However, spread and attendance density did not significantly interact to predict performance. The spread of the game did not moderate the relationship between crowd density and performance, although those teams who were predicted to win were significantly likely to do so. Interestingly, underdog teams showed a significant boost in performance in as the audience of home games increased; this was not found for favoured teams. This is contrary to Zajonc's (1965) social facilitation theory that would expect these less skilled teams to perform worse under large audiences. It could be that the results did not show the expected relationship due to the classification of being the underdog team. The findings indicated that if teams who were classed as being the underdogs were focused on or aware of having an underdog status, it was not necessarily negative. These teams could have risen to the challenge of facing a superior opponent. The results do not suggest that these teams were in any way intimidated by their opponents. This is unsurprising; as it is likely for athletes who are faced with difficult odds to attempt to make the best of their situation rather than adopting a defeatist attitude. Otherwise it would be unlikely for them to have risen to a professional level within their field. Additionally, regardless of how favoured a team is in comparison to their opponent, all of the players in the NBA are professional athletes. A large proportion of these players would have played countless games throughout their high school and college careers before being selected to play in a professional league. Therefore, they would have had years to hone the skills required to play basketball well, meaning that these proficiencies would be well learned and performed with relative ease. In accordance with Zajonc's (1965) social facilitation theory, the concept of a skill being well learned is vital to elicit enhanced rather than diminished performance under audience conditions. Thus, it was perhaps unrealistic to expect larger audiences to elicit decreased performing in professional athletes; these teams may be rising to the challenge of overcoming their superior opponent.

Social facilitation theory (Zajonc, 1965) would also expect that favoured teams show an increase in performance when the audience is larger. This was not found in the present study. Teams who were predicted to win did not show a significant boost in performance, which may be explained by the team's confidence. It could be that these favoured teams are aware that they are the superior team, and are confident in their ability to win. Compared to underdog home teams who may gain confidence from a supportive home audience, favoured teams may feel capable of winning regardless of how many people are watching the game. This could, perhaps, explain why performance improvements were found for underdog teams but not for favoured teams.

National versus local screening of the game was not found to be significantly related to margin of victory, nor was the interaction between screening and favourability. These findings do not support Zajonc's (1965) social facilitation theory, which posits that the dominant response will be amplified under audience conditions. Furthermore, the results indicate that regardless of being classed as the favourite or underdog in a game players are not focused on the wider audience outside the arena. This is perhaps also not surprising, as it is much more likely that the audience is focused on the physically present audience in the arena rather than home audiences.

Experience and Audience Size in Relation to Performance

Basic social facilitation theory (Zajonc, 1965) also suggests that more experienced players will improve their task performance under audience conditions while less experienced players will perform worse when there is a crowd present. It was consequently predicted that more experienced teams would perform better as the size of the audience present at a game increased, while less experienced teams would perform worse in games with larger audiences. The results of the present study contradicted this hypothesis. Average experience difference was independently related to margin of victory, indicating that NBA players were

enhanced by larger audiences, leading them to win a game by an increased margin of victory. This result was found to hold regardless of the experience level of the teams. The interaction between average experience difference and attendance was significant, meaning that the more experienced a team was in comparison to their opponent moderated the relationship between attendance density and margin of victory. Teams that were more experienced than their opponents and those who were less experienced than their opponents both performed significantly better under larger audiences than they did under smaller audiences. Interestingly, though, less experienced teams enjoyed a superior boost in performance under larger audience conditions than more experienced teams did. That is, the size of the audience appears to be more important to less experienced teams' performance than it is for teams who are more experienced than their opponents. These findings partially support Zajonc's (1965) social facilitation theory as performance increases were seen for all teams. Although the results did not show a performance decline that was expected in accordance with Zajonc (1965), this may be explained by the professional status of the athletes involved. Again, it may be unrealistic to expect sub-standard performances from teams in the NBA when large audiences are present as they are professional sportsmen possessing a set of well-practiced skills. It is also probable that less experienced teams will be aware that they are facing more experienced opponents, and the support of the home audience may again help explain why less experienced teams showed an increased performance boost as these teams could gain increased confidence in their ability to overcome a more experienced opponent from the audience.

Furthermore, it was expected that the television screening of a game (i.e., national versus local screening) would be related to the margin of victory as this imagined audience would physiologically arouse the players involved in the game (see Fredrikson & Gunnarsson, 1992) leading to the amplification of the dominant response. It was hypothesised

that the increased viewership of nationally screened games would arouse players more than locally screened games. Consequently, more experienced teams would show a performance increase while less experienced teams would encounter a performance decline. The results of the current study indicated a partially opposite effect to the one expected. The findings indicate that teams whose players were on average less experienced than their opponents performed significantly better in nationally screened games with a larger home audience than they did in locally screened games. This effect was not found for teams more experienced than their opponents. These results are contrary to the social facilitation hypothesis (Zajonc, 1965), but support Forgas et al.'s (1980) finding that squash players who were less skilled than their opponents improved their performance with an audience.

The results of the present study suggests that less experienced teams may be influenced by an imagined audience comprised of millions of viewers who would be watching the game on live television, but this may not be a relevant factor in explaining the performance of more experienced teams. It may be that these more experienced players have become somewhat immune to the thought of large home audiences as they have been performing in such games for longer than their less experienced counterparts. This thought supports Underwood's (1976) assertion that seasoned athletes may be able to disregard audiences watching them perform. Conversely, the less experienced teams experienced a boost in performance under these increased audience conditions which could be explained by them not being habituated to larger audiences due to them having spent less time under audience scrutiny. The dominant response (which is success due to their professional status as sportsmen) was facilitated in these "less experienced" teams under larger imagined home audience conditions. Additionally, it must be noted that most of the nationally televised games included in these analyses were playoff games. This may have affected the results as younger player may be more physiologically and psychologically aroused when playing

playoff games due to the higher stakes involved with the game, which could lead to them trying harder and as a result their performance increased. However, more experienced teams may be used to playing in playoff games and not be as nervous or excited when playing these games as they are now a regular occurrence.

Although the results of this study did not support the hypotheses that teams' favourability status and experience compared with that of their opponent would moderate the relationship between crowd density and margin of victory, the results are nonetheless interesting. As far as the researcher is aware, this is the first study to assess the effect that attendance has on performance in a large scale study, and the results suggest that attendance may be especially important for predicting performance in games involving younger teams. Additionally, no research has taken into account the imagined audience of television viewers at home. The results of the current study indicate that less experienced players may reap the benefits of increased viewership which is not found in more experienced teams. This could be extremely useful for considering team line-ups in important games such as the playoffs which are all nationally screened. Further research is needed in this area to investigate these ideas fully.

Limitations and Future Research

There were several limitations to this study. Firstly, the current study only investigated home games, which could explain why only an increase in performance was seen when there were large audiences watching the game. Epting et al. (2011) suggest that audiences may affect team performances in sport, and it has also been noted that audiences engage in interactive behaviour with the athletes playing a game (Cox, 1994). During home games, it could be assumed that these audiences would be predominantly supportive as the teams are playing in their home towns. This could explain the boost in performance in games with more attendees. Future research could use the same data to compare a team's

performance during home games and away games to ascertain whether there are any social facilitation effects.

Furthermore the current study only utilised the experience of the starting five players on each team. This may not give an accurate representation of the experience of the team as players who were on the bench at the beginning of the game usually act as substitutes for starting players to give them time to recover. The experience of the benched players was unaccounted for in the current study. Future research could assess the experience of the benched players in addition to the starting players to gain a more accurate understanding of how experience relates to performance in games with differing crowd sizes.

This study used the summed previous experience of the starting five players from each team in analyses. A limitation of this is that there could be an optimal level of experience that leads to the greatest improvement in performance when playing in games with larger audiences. For example, it could be best for a team to use its most experienced players at the beginning of the game, and replace these with novice players at regular intervals to work with the veterans. Further research is needed in this area to ascertain whether particular groupings of more experienced and less experienced players' results in optimal performance. Another limitation of the experience variable is that it only included previous game experience in the NBA league. Although many NBA players are recruited directly from American colleges, some players have experience playing internationally, which was not taken into account in the current study. For example, Manu Ginobili played professionally in both the Argentine and Italian leagues for seven years before joining the NBA (Basketball-Reference, n.d.) However, his experience playing professional basketball in these countries was not accounted for in the current study. This limitation could be overcome by future researchers by taking into account whether players have had experience playing in other professional leagues both within America and internationally.

Another factor that was not taken into account was the amount of time that team members had spent playing with each other, which could also be considered a limitation of the current study. It is likely that teams who have played together over multiple seasons are better attuned to each other's style of playing basketball. Additionally, they will have spent a greater amount of time practicing together and building social bonds such as trust, respect, and mutual understanding that could lead to improved team performance. Future research could take into account the amount of time that teams have played together in the NBA to see whether this affects performance.

A potential limitation to the research could be the use of favoured or underdog status as a proxy for skill. Social facilitation theory (Zajonc, 1965) suggests that success on the performance of tasks that are familiar will be amplified when the performer is observed by an audience. Therefore, it was decided that a favoured status indicated that a team had better basketball skills than their opponent. However, the results indicated that underdog teams experienced the performance boost under larger audiences which it was expected would be seen in favoured teams. It could be that the spread, which was used to ascertain the favourability of each team, was not a good indicator of team skill. Future research could remedy this by taking into account various skills displayed during the previous game to the one being investigated, such as the percentage of field goals and free throws made by each team.

As previously mentioned the current study only investigated professional athletes which may be a limitation. The results of the study did not fully support social facilitation theory (Zajonc, 1965) as there was no decrease in performance observed for any teams. The same results were found when comparing less experienced and more experienced teams. It is possible that there is no such thing as a "bad" response in the NBA as these are highly trained athletes who have honed very specific skills over a long period of time. Therefore, future

research could compare NBA games to non-professional games to see whether there is a significant interaction between audience size and experience in the prediction of increased or decreased performance in games.

An interesting concept for future research would be to further explore the relationship between teams' experience difference and performance. A relationship was found between these two variables, although the investigation of this particular relationship was not the primary focus of this study. Further exploration of the difference between teams' experience levels as a predictor of margin of victory with variables such as crowd size moderating this relationship would be worthwhile as it may help explain the relationships between experience, attendance, and performance. Furthermore, future research could investigate whether being a less experienced, underdog team may lead to even greater performance benefits in games with larger audiences. Favourability and experience in relation to audience size and performance were only looked at individually in the present study. Future research could analyse these two important variables together to provide further insight into their relationship with audience size and performance.

The present study also only investigated social facilitation across a large number of seasons which included thousands of games. This could be a limitation as there may be social facilitation effects supporting Zajonc (1965) and effects contrary to social facilitation theory which could be hidden. It is possible that one team may show specific trends over a period of years, or only during one season as players often change between teams between seasons. Teams could have been investigated individually across several seasons, or seasons could be investigated individually. Future research could focus on finding trends across seasons or individual teams rather than investigating the complete set of games simultaneously.

One final limitation could be related to the nationally versus locally screened variable in that there are many more locally screened games than nationally screened games. Most of

the nationally screened games are playoff games, which are always screened to the entire country rather than just specific states in America. In some respects, the playoff games are more important to teams than regular season games as they have higher stakes. Investigating playoff games individually may provide additional information to further explain the relationship between the imagined crowd and performance. As far as the author is aware, the concept of an imagined audience has not previously been investigated in sport. This is an interesting concept to be examined further by future researchers, which could potentially be explored by reminding players before a game that they will be viewed by varying numbers of viewers at home (for example, a hundred thousand versus ten million).

Implications

The results of the present study have important implications to be considered when explaining social facilitation in the NBA basketball. Contrary to expectations, underdog teams and less experienced teams showed increases in performance as audience sizes enlarged. These results contradict social facilitation theory (Zajonc, 1965); both adding to the literature on the topic and showing that much more research is needed in this area. Perhaps the most interesting finding of the present research is that underdog teams perform significantly better in nationally televised games than locally televised games. As previously mentioned, a large majority of these games are playoff games which have higher stakes than regular season games. This information may be vital for coaches when considering which players will be involved in playoff games, as the results indicate that less experienced players may perform significantly better in these games.

Conclusion

Social facilitation is a fascinating example of the way humans perceive each other and react to the presence of others around them. The sporting arena is not immune to the

judgements and innate reactions of both the spectator and the athlete. Social facilitation in sports is an interesting yet understudied phenomenon, and past research has failed to assess changes in performance which may be experienced by athletes in large crowd sizes which number thousands or even millions of people. This gap in the literature leaves much to be explored and explained. As our lives become more connected by technology, we increasingly find our performances fall under the scrutiny of large numbers of people. Gone are the days where the only people who saw a sports game were the ones who were physically present. In this increasingly connected world, understanding the ways in which others can alter the performance of a person undertaking a task is important for optimisation of performance, not only in the sporting arena but also in organisations worldwide.

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